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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicants: Di-An HONG et al.

Title: METHOD AND APPARATUS FOR BIOMETRIC CONTROL OF DISPLAY INDICATOR

Art Unit: 2672

Examiner: Faranak FOULADI-SEMNANI

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APPEAL BRIEF

Sir:

Pursuant to 37 C.F.R. §1.192, the Applicants hereby respectfully submit the following Brief in support of their appeal. Pursuant to 37 C.F.R. §1.192(a) this brief is being filed in triplicate.

(1) Real Party In Interest

The real party in interest is Motorola, Inc.

(2) Related Appeals and Interferences

There are no other appeals or interferences known to Appellant, the Appellant's legal representative, or assignee that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

Claims 1 through 22 are pending prior to the entry of a Rule 116 amendment. Claims 1 through 22 are twice and finally rejected and this appeal is from the rejection of claims 1 through 13 and 21 and 22.

(4) Status of Amendments

An Amendment After Final has been submitted contemporaneous with submission of the Notice of Appeal to cancel claims 14 through 20. The status of this amendment is presently unknown.

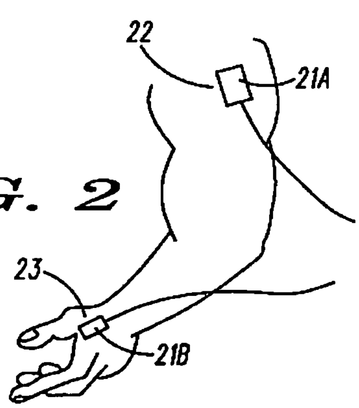
(5) Summary of Invention

This application relates to display indicators such as on-screen cursors. Such indicators serve to highlight an on-screen element or to otherwise identify a screen area where additional actions are intended. Prior art mechanisms to facilitate manipulation of such display indicators include the ubiquitous mouse, touch pad, arrow keys, track ball, and the like. Such devices also often have one or more control surfaces that, when asserted by a user, provide a selection signal that corresponds to the present display indicator position. This functionality is often referred to as a "click" and includes both a so-called "left click" and a "right click" [page 1, lines 11-19]. This application concerns the use of electromyogram signals

to control the positioning of and, in some embodiments, click assertion as corresponds to such on-screen cursors.

With reference to Figure 2 (reproduced below for the convenience of the reader), a first electromyogram sensor (21a) can be positioned to sense a first muscle (such as a shoulder muscle (22)) and a second electromyogram sensor (21b) can be positioned to sense a different muscle (such as a hand muscle (23)) [page 4, lines 2-5]. With reference to Figure 1 (reproduced below for the convenience of the reader), these electromyogram signals are sensed (11). When a first electromyogram signal is sensed (12), such as an electromyogram signal associated with the shoulder area, the angle of movement for a display indicator is established (13). When a second electromyogram signal is sensed (14), such as an electromyogram signal associated with hand muscles, that display indicator is moved (15) in the direction established earlier [page 3, lines 22-25]. Electromyogram sensors typically provide an output voltage that corresponds to the strength of the musculature electrical signal [page 3, lines 31-32]. Accordingly, electromyocardiogram signals are sensed and translated to establish angle of movement information and magnitude of movement information for a display indicator such as an on-screen cursor [page 4, lines 26-29].

FIG. 2



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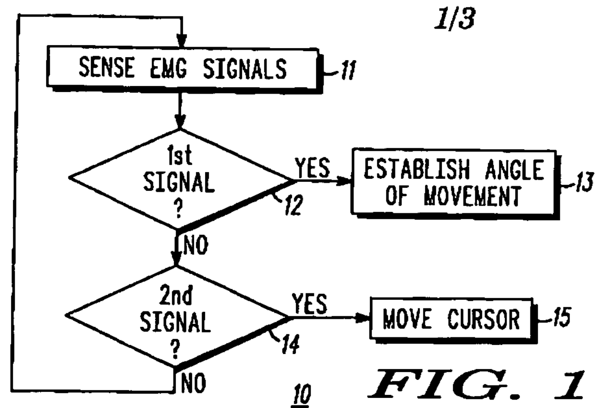


FIG. 1

To illustrate, an on-screen cursor (61) may have an initial position and orientation on a display (38) as shown in Figure 6 (reproduced below for the convenience of the reader). The presence of a first myocardiogram input (as corresponds, for example, to a first muscle or muscle group) causes the angular direction of movement for this on-screen cursor (61) to be rotated (71) as depicted in Figure 7 (reproduced below for the convenience of the reader). To aid the user in facilitating this step, the on-screen cursor (61) can itself be rotated in a corresponding fashion as denoted in Figure 7. As an alternative, another on-screen indicator (81) can be rotated as shown in Figure 9 (reproduced below for the convenience of the reader) to indicate the present angular direction of movement. Presence of the second electromyocardiogram signal (as provided, for example, by a different muscle or group of muscles) then causes this on-screen cursor (61) to move (111) in the previously determined angular direction as illustrated in Figure 11 (reproduced below for the convenience of the reader [page 6, line 28 through page 8, line 9].

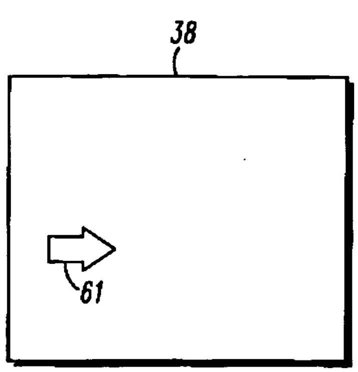


FIG. 6

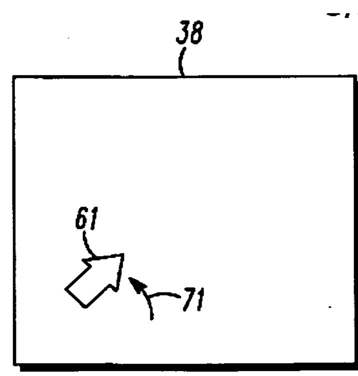


FIG. 7

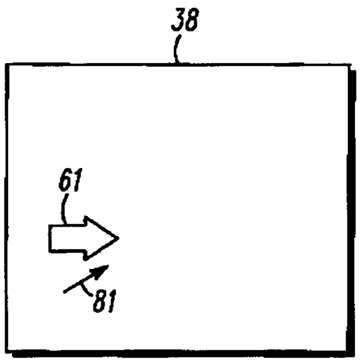


FIG. 9

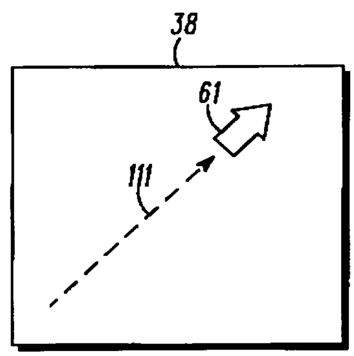
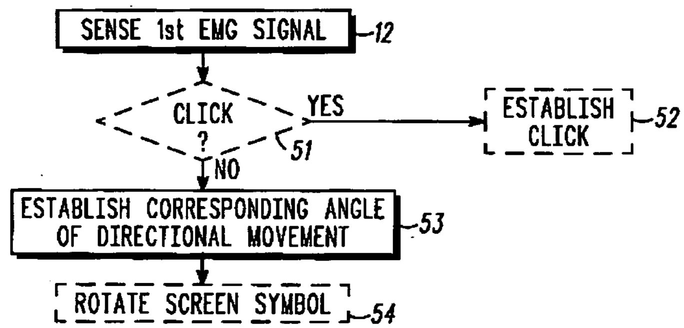


FIG. 11

This application also encompasses the provision of a click, including a left click or a right click, in response to an electromyogram signal. With reference to Figure 5 (reproduced below for the convenience of the reader), a click (comprising either a left and/or a right click) can be detected (51) by sensing, for example, a very short duration electromyogram signal. A user would only flex a monitored muscle very briefly to thereby create an electromyogram signal that would be detected (51) as a click. Other approaches could also be used. For example, two quick successive muscle flexings could be used instead, or a short first flexing following by a medium length second flexing. Upon detecting (51) an electromyogram signal that is to be interpreted as a click, a corresponding click assertion can be establish (52) [page 6, lines 9-22]. (The second electromyogram signal can be used in a similar manner (see Figure 10 and the corresponding text). This is one way to facilitate distinguishing a left click from a right click.)

FIG. 5



These embodiments provide a relatively simple, economical, effective, and easily learned mechanism for controlling an on-screen display indicator such as an on-screen cursor. Only two biometric sensors are required to achieve these results. Because virtually all at least somewhat operational muscles can be so employed, this approach can be successfully utilized with virtually all potential users [page 9, lines 13-19].

(6) Issues

Claims 1 through 13 and 21 and 22 are rejected under 35 U.S.C. § 102(e) as being anticipated by Woods et al. (U.S. Patent No. 6,413, 190) ("Woods").

(7) Grouping of Claims

Group I: 1, 5-9, 13, 21

Group II: 2

Group III: 3, 4

Group IV: 10-12, 22

(8) Argument

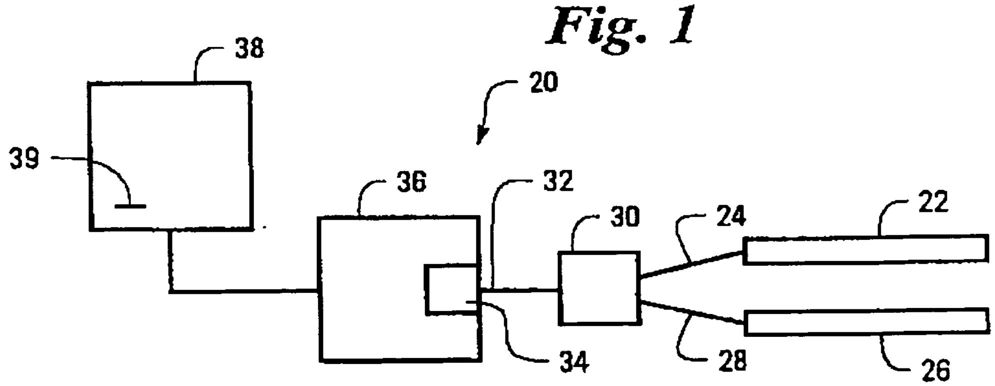
Group I

Rejection Under 35 U.S.C. § 102

Claim 1 has been rejected as being anticipated by Woods. Woods discloses a rehabilitation apparatus and method that makes use of body sensors (to detect muscle contraction, body position, and/or body movement) [column 4, lines 49-53]. Resultant signals are sent to a computer port (such as a serial port, mouse port, and the like) and processed by software to control various components of a computer system [column 5, lines 1-11]. Woods teaches that this can include control over movement of an on-screen device. For example, Woods teaches that these body signals can be interpreted as assertions of an arrow key or as indicating movement of a mouse in "one direction" [column 5, lines 11-17].

With reference to Figure 1 of Woods (reproduced below for the convenience of the reader), Woods discloses a system for rehabilitation therapy having a first body sensor (22) and a second body sensor (26). Resultant body signals are used to drive a virtual game piece (39) on a computer display (38) [column 6, line 16 through column 7, line 6].

Fig. 1



In one embodiment, Woods teaches that a single body sensor can be used to move a game piece along a single axis such as moving a cursor to the left and right along a horizontal axis of a computer display [column 7, lines 8-11]. Woods also teaches that the direction of such a cursor or game piece can be controlled by two different body parts wherein each body part has a separate sensor as suggested in Figure 1 presented above [column 8, lines 25-29]. Woods provides the following example of an embodiment that facilitates positioning such a cursor where desired on such a display:

> In some embodiments, two dimensions in movement are used, corresponding to two display dimensions on the screen. In one example, bending and straightening the right forearm toward and away from the shoulder causes horizontal axis cursor movement, and the same movement of the left arm causes vertical axis cursor movement [column 8, lines 11-16].

Woods is therefore seen to disclose use of one or more body sensors to provide corresponding cursor movement instructions. Woods only discloses or suggests, however, correlating each such body signal to a specific direction of movement (such as horizontal or vertical). Notwithstanding a broad plethora of embodiments, Woods makes no suggestion that a given body signal can be utilized to specify a particular angle of cursor movement distinct from movement along that angle of trajectory.

Claim 1, however, provides for the sensing of first and second electro-myogram signals followed by, in response to sensing the first electromyogram signals, establishing an angle of directional movement for an on-screen cursor. Woods does not disclose or suggest such an approach. Rather, the angle of directional movement as corresponds to a given incoming body signal is pre-established (for example, a first body signal always corresponds to horizontal

movement, and a second body signal always corresponds to vertical movement). Woods therefore does not anticipate claim 1.

Group I also includes independent claim 21 that includes recitations addressing this same point of differentiation, albeit in somewhat different language. Claim 21 specifies, in response to receiving a first biometric signal, deriving corresponding angular direction of movement information for the on-screen cursor and then, in response to receiving a second biometric signal, deriving corresponding magnitude of movement information for the on-screen cursor. While Woods may be viewed as deriving a magnitude of movement information, Woods provides no teaching that a particular direction of angular movement be "derived" in response to received biometric signals. Instead, a predetermined direction of movement is preordained and tied to a given incoming biometric signal. Woods therefore fails to anticipate the recitations of claim 21 as well.

Group II

Rejections Under 35 U.S.C. § 102

Claim 2 has been rejected as being anticipated by Wood. Claim 2 is dependent upon claim 1, which claim has been shown allowable above. Claim 2 further specifies that the first sensed electromyogram signals originate from a first muscle and the second electromyogram signals originate from a second, different muscle. As a net result, claim 2, read together with the recitations of claim 1, specifies that electromyogram signals from a first muscle establish an angle of directional movement for a cursor while electromyogram signals originating from a second muscle serve to move the on-screen cursor in a previously determined direction. To the extent that Woods discloses the use of body signals originating

from different parts of the body, Woods only teaches or suggests that each such signal represents a direction of movement bundled with a magnitude of movement. Woods makes no teaching or suggestion that correlates to the recitations of claim 2 in combination with claim 1. Woods therefore fails to anticipate claim 2.

Group III

Rejections Under 35 U.S.C. § 102

Claim 3 has been rejected as being anticipated by Woods. Claim 3 is dependent upon claim 1, which claim has been shown allowable above. Claim 3 further specifies that, when establishing the angle of directional movement for the on-screen cursor in response to sensing the electromyogram signal, an on-screen directional indicator is rotated in a manner that corresponds with the angle of directional movement. Claim 4, also a member of Group III, further specifies that it is the on-screen cursor that is rotated in correspondence with this angle of directional movement. Woods simply makes no teaching or suggestion whatsoever regarding rotation of an on-screen cursor or other on-screen device in response to establishing an angle of directional movement. Accordingly, Woods does not anticipate the recitations of the claims of this group.

Group IV

Rejections Under 35 U.S.C. § 102

Claim 10 depends upon claim 1 which claim has been shown allowable above. Claim 10 further specifies asserting a mouse click in response to sensing at least one of the electromyogram signals. Other claims in this group specify that the mouse click comprises a right click or a left click. Woods discloses emulating mouse movements via the sensing of body parts, but Woods makes no teaching or

suggestion that a non-movement action be emulated in this way. In particular, Woods make no teaching or suggestion that a mouse click of any kind be established or otherwise represented by such body part movements. The claims of this group are therefore not anticipated by Woods.

(9) Appendix

1. (Original) A method for manipulating an on-screen cursor comprising:

- sensing first electromyogram signals;

- sensing second electromyogram signals;

- in response to sensing at least some of the first electromyogram signals, establishing an angle of directional movement for the on-screen cursor;

- in response to sensing at least some of the second electromyogram signals, moving the on-screen cursor in a previously determined direction.

2. (Original) The method of claim 1 wherein sensing first electromyogram signals includes sensing first electromyogram signals from at least a first muscle and wherein sensing the second electromyogram signals includes sensing second electromyogram signals from at least a second muscle, which second muscle is different from the first muscle.

3. (Original) The method of claim 1 wherein establishing an angle of directional movement for the on-screen cursor includes rotating an on-screen directional indicator that corresponds to the angle of directional movement.

4. (Original) The method of claim 3 wherein rotating an on-screen directional indicator that corresponds to the angle of directional movement includes rotating the on-screen cursor.

5. (Original) The method of claim 1 and further comprising wirelessly transmitting information signals that at least correspond to the first and second electromyogram signals.

6. (Original) The method of claim 1 and further comprising wirelessly transmitting information signals that at least correspond to the angle of directional movement for the on-screen cursor and movement of the on-screen cursor in a previously determined direction.

7. (Original) The method of claim 1 and further comprising processing the first and second electromyogram signals to at least level shift the first and second electromyogram signals.

8. (Original) The method of claim 1 and further comprising processing the first and second electromyogram signals to at least scale the first and second electromyogram signals.

9. (Original) The method of claim 1 and further comprising processing the first and second electromyogram signals to at least level shift and scale the first and second electromyogram signals.

10. (Original) The method of claim 1 and further comprising, in response to sensing at least one of the electromyogram signals, asserting a mouse click.

11. (Original) The method of claim 10 wherein asserting a mouse click includes asserting a mouse left click.

12. (Original) The method of claim 10 wherein asserting a mouse click includes asserting a mouse right click.

13. (Original) The method of claim 1 wherein sensing first electromyogram signals includes sensing first electromyogram signals that at least equal a predetermined threshold.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Original) A method for manipulating an on-screen cursor comprising:

- in response to receiving a first biometric signal, deriving corresponding angular direction of movement information for the on-screen cursor;

- in response to receiving a second biometric signal, deriving corresponding magnitude of movement information for the on-screen cursor.

22. (Original) The method of claim 21 and further comprising, in response to receiving at least one of the first and second biometric signals, deriving a corresponding mouse click assertion.

Respectfully submitted,

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